

## Specifications Amendments

### TITLE OF INVENTION

Sealed Tight

Application # 10/082,515

### CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

### STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT Not applicable

## BACKGROUND OF THE INVENTION

[0001] Sealed Tight is an agricultural waste treatment system that uses psychrophilic anaerobic digestion to dispose of animal waste solids.

[0002] Psychrophilic anaerobic digestion has shown promise as a way to dispose of animal waste. This is as described by Cullimore in Agricultural Waste Journal from December, 1985. The problem with existing systems is the inability to handle the volume of the waste stream of ever-expanding facilities. These are hopper-type digesters.

[0003] Existing methane capturing systems are floating systems, fitted with pockets to capture biogas, and cover systems. These systems contain an atmosphere of biogas equal to or greater than our own. They are subject to wind damage and are at danger in flood situations.

## BRIEF SUMMARY OF THE INVENTION

[0004] Sealed Tight is a sealed system that converts existing waste storage systems into anaerobic digesters. Sealed Tight decreases the dangers of environmental contamination from agricultural waste and reduces the amounts of contaminants released. The capacity created by converting existing pit into a digester, and longer holding time, causes manure to be more thoroughly digested than in existing systems. Finished slurry is of a greater grade, increasing availability of nutrients to plants, thus adding value. Sealed Tight provides a complete waste treatment system and an economical solution to the dangers of agricultural waste contamination.

[0005] Sealed Tight uses vacuum for ballast, eliminating the danger of wind damage to the membrane. Vacuum pressure also eliminates the danger of the membrane lifting off the pit in a flood situation.

## BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0006] Figure 1A shows a cross-sectional of the Sealed Tight system including manure pit, wall, membrane and all necessary plumbing.

## DETAILED DESCRIPTION OF THE INVENTION

[0007] Sealed Tight is a continuous flow, psychrophilic anaerobic digester waste treatment system that eliminates the danger of flood damage. Sealed Tight converts existing manure pits into anaerobic digesters.

[0008] The anaerobic digester consists of an airtight diaphragm secured to a concrete beam. The diaphragm is kept under a negative pressure for ballast, for protection during flood situations. Pressure is regulated by a pressure switch located on the vent to keep the digester under vacuum. The perimeter beam is plumbed to receive waste stream, to pump off biogas, to provide for effluent overflow, and to remove fully processed slurry. Biogas is pumped into a storage tank and an emergency photovoltaic pump is located on the vent, above flood stage, to flair off gas during a flood. Valves are located on an overflow pipe to control the flow of effluent, to allow for the settling of slurry in the digester before effluent is released.

[0009] Sealed Tight will not interfere with the normal operations of the farm. The farmer will continue to dispose of manure using existing procedures and equipment. The farmer must only close overflow valve before sending manure into the pit. The farmer must allow at least eight hours for settling before opening overflow valve.

[0010] FIGURE 1A shows a cross-section view of the Sealed Tight system as follows

- 1 Valves to control the flow of effluent
- 2 Pipe to pump gas to storage
- 3 Concrete retaining wall around pit
- 4 Emergency photovoltaic pump
- 5 Pressure switch to control pressure in digester
- 6 Diaphragm membrane
- 7 Drain for finished sludge
- 8 Inlet for waste
- 9 Valve to seal system in flood stage